



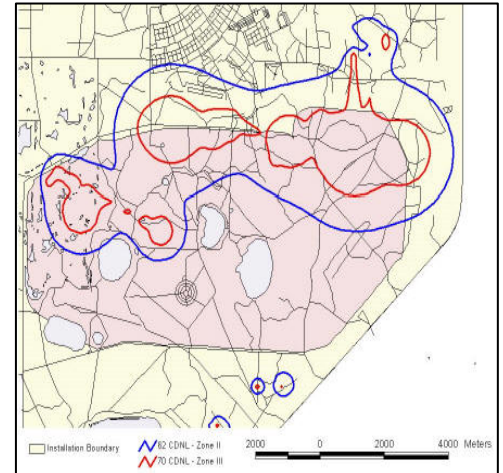
US Army Corps
of Engineers®

Engineer Research and
Development Center

BNOISE2 — Blast Noise Impact Assessment

Technology

BNOISE2, an Army-developed PC-based microcomputer application that runs in a Windows 95/98/NT/XP/2000 environment, enables calculation and display of blast noise exposure contours resulting from specified operations involving large guns and explosive charges. BNOISE2 accounts for statistical variation in received noise level due to weather, and is intended primarily for the purpose of obtaining long-term average noise exposure assessments for a protracted training schedule. A feature known as ONESHOT provides a statistical prediction of noise level at a particular location for individual firing events. BNOISE2 offers improved propagation algorithms; updated weapons source models, the effects of land-water boundaries and terrain, and an improved user interface. The software includes consideration of type of weapon and ammunition, number and time of rounds fired, range attributes, weather, and assessment procedures and metrics. It accounts for spectrum and directivity of both muzzle blast and projectile sonic boom, which facilitates accurate calculation of propagation and frequency weighting. Source model parameter values are based on empirical data. The propagation algorithms are based on sophisticated calculations and experimental data. Available metrics include single event metrics such as sound exposure level (SEL) and peak level and average metrics such as day-night noise level (DNL).



BNOISE2 is designed to maximize user productivity. The program features a user-friendly point-and-click graphic user interface, pull down menus, and a help feature. Information regarding the types of weapon and ammunition, the locations at which the firing takes place, the number of shots during day- and night-time, etc., is entered into an activity table. Required information regarding the guns and ammunition (source models) and ranges is stored in databases and chosen from pick lists. The program includes a library of database records, including weapons, metrics and frequency weighting filters. The propagation algorithm is used to calculate sound levels at each node of a user-defined geographical grid. The resulting array of noise level values is converted to contours and prepared for display by existing software known as NMPlot (developed for the U.S. Air Force and the U.S. Federal Aviation Administration). This software enables display of noise contours, has a zoom control for viewing various levels of detail, and can print map overlays. Using NMPlot also enables noise contour results to be combined with those from other Federal noise models to obtain cumulative noise exposure assessments. Results can be exported in Environmental Systems Research Institute, Inc. (ESRI) "Shape" (SHP) or Auto-Desk "Drawing eXchange Format" (DXF) file formats.



BNOISE enables calculation and display of blast noise exposure contours from operations involving large guns and explosive charges.

Problem Military training and testing operations can cause significant noise impact on the surrounding area. Community response to noise in the form of complaints and/or political pressure, legal action, and damage claims, all hamper mission execution. One element of an effective noise management strategy is the ability to accurately forecast and assess community noise exposure. Evaluation of weapons noise impacts on humans and animals requires knowledge of both physiological and psychological reactions to weapons noise. Assessment of these effects in any given scenario requires algorithms for prediction of the noise field around the weapon, from small to large distances.

Expected Cost To Implement BNOISE2 software is currently available free to government users. The software application runs under Windows 95/98/NT/XP/2000 operating systems on typical desktop computers. Significant time investment is required to become proficient in using the software.

Benefits/Savings BNOISE2 enables improved quantification of blast noise impact, making the program useful to all of the Services, and for application in the private sector activities that involve the use of explosives. This facilitates noise management and planning for existing and new ranges. It can also help avoid noise complaints that can lead to curtailment or closure of training and testing facilities.

Status BNOISE2 is the culmination of extensive basic and applied research regarding the emission, propagation, and reception of blast noise from military weapons. BNOISE2 software is currently available to government users from the listed ERDC POC. Blast noise assessments and noise impact management planning, using BNOISE2 and other noise management technology, are available from the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) Environmental Noise Program.

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Distribution Sources BNOISE2 software is currently available to government users on request from the listed ERDC POC.

Available Documentation The BNOISE2 program is packaged with a help feature. Limited technical assistance is also available through the USACHPPM Environmental Noise Program, which can be contacted through e-mail at: NoiseQuestions@AMEDD.ARMY.MIL

Available Training No formal classroom training is currently resourced. However, limited technical assistance may be requested through the USACHPPM Environmental Noise Program. Some introductory familiarization is occasionally offered as part of noise workshops.

Available Support The program includes a help feature. Technical support for the final version of BNOISE2 will be provided through USACHPPM. Reasonable assistance is available to government users at no cost. More extensive assistance or training may be available by request on a reimbursable basis.